The State and Dynamics of Athletics Development in the Regions of the Russian Federation

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Abstract— The article attempts to assess the achievements level of athletes' in three Russian regions – Tatarstan, Chuvashia, Sakha (Yakutia) in 2016-2018 based on the analysis of the All-Russian database "Ratings of athletes". The following indicators were evaluated: the quantitative indicator – the number of athletes in ARAF rating in a discipline per year; the qualitative indicator – the average position of athletes in the ARAF rating in a discipline per year; integral indicator – the average position per athlete. The analysis made it possible to assess the current state of athletics in these regions, the prospects for its development in individual track and field athletics disciplines, which, in turn, will help to ensure strategic planning for athletics development in the country.

Keywords—track and field athletics; rating; region; Tatarstan; Chuvashia, Sakha (Yakutia); achievements; analysis

I. INTRODUCTION

Track and field athletics is one of the most attractive and popular sports, as it provides for athletes an opportunity to realize their individual potential in various events. Track and field athletics in Russia has rich traditions, as evidenced by the long history of its spread and development in the pre-revolutionary and Soviet periods, as well as the high-profile Olympic and international achievements of athletes in the second half of the last century and at the beginning of the present century.

Today, voluminous factual material has been collected, however, its analysis with an assessment of the state and identification of athletics development tendencies in the

TABLE 1. INDICATORS USED IN DATA ANALYSIS

Indicators	Quantitative indicator	Qualitative indicator	Inegral indicator
Athletes	The number of athletes in ARAF rating in a discipline per year.	The average position of athletes in the ARAF rating in a discipline per year. *It was determined as the ratio of the sum of the rating positions of the region's athletes to their number in the rating.*	The average position per athlete. *It was determined as the ratio of the average place of athletes in the ARAF rating to their number in the rating.*
Coaches	The number of athletes in the ARAF rating involved in the coach.	The average position of athletes in the ARAF rating engaged a coach. *It was determined as the ratio of athletes rating positions sum engaged a coach to their number in the rating.*	The average position per athlete engaged a coach. *It was determined as the ratio of the athletes average place in the ARAF rating engaged a coach to their number in the rating.*
Organizations	Number of athletes in the ARAF rating representing the organization.	The average position of athletes in the ARAF rating representing the organization. *It was determined as the ratio of athletes rating positions sum representing the organization to their number in the rating.*	The average position per athlete representing the organization. *It was determined as the ratio of the average place of athletes in the ARAF rating representing the organization to their number in the rating.*

TABLE 2. QUANTITATIVE COMPOSITION OF REPRESENTATIVES OF REGIONS

Region	Athletes		Coaches	Organizations
	Male	Female		
Tatarstan	378	358	110	40
Chuvashia	159	221	117	40
Sakha (Yakutia)	48	44	25	11
Total	**585**	**623**	**252**	**91**
	1208			

regions of the Russian Federation and athletes' achievements in these regions at the All-Russian level is not conducted sufficiently deeply.

In this regard, the research problem is to assess the level and dynamics of athletes' achievements in certain regions of the Russian Federation.

The object of the study is athletics development in Russian regions.

The subject of the study is the level and dynamics of athletes' achievements in the republics of Tatarstan, Chuvashia, Sakha (Yakutia) in 2016-2018.

The purpose of the study is to assess the level and dynamics of athletes achievements from the republics of Tatarstan, Chuvashia, Sakha (Yakutia) at the current stage of track and field athletics development.

II. MATERIALS AND METHODS

The initial data for quantitative analysis were taken from the electronic database "athletes' Rankings" [1]. Data for the period from 2016 to 2018 were analyzed.

Athletes representing the Republics of Tatarstan, Chuvashia and Sakha (Yakutia) were selected from the list of athletes included into the rating. The following indicators were taken into account: year, track and field discipline, athlete's name and place in the rating, coach(es), organization(s).

Based on these data, the indicators of athletes, coaches and organizations were determined (Table 1).

The analysis was carried out in the following events of track and field athletics:

1. Running events - 100, 100/110 hurdles, 200, 400, 400 hurdles, 800, 1500, 3000 steeplechase, 5000, 10000 m, marathon.
2. Jumping events – high jump, pole vault, long jump, triple jump.
3. Throwing events – discus, hammer, javelin throw, shot put.
4. Race walking - 20 K (women), 50 K (men).
5. Heptathlon (women) / decathlon (men).

A total of 1208 records of athletes in various events were processed, 252 coaches and 91 organizations, represented by the athletes were identified (Table 2).

III. RESULTS AND DISCUSSION

The quantitative indicator reflects the number of athletes in the All-Russia Athletic Federation (ARAF) rating. The number of athletes in the rating was calculated on average per discipline of each group (Fig. 1). The dynamics of Tatarstan and Chuvashia athletes' presence in the ARAF rating is positive with a significant advantage for representatives of Tatarstan (over 200 people in 2018). The Republic of Sakha (Yakutia) is represented in the ranking by only about 20 athletes.

The same ratio is maintained in running events, both in men and in women. Tatarstan is noticeably ahead of the other two regions in the number of jumpers, as well as throwers in the ranking. Race walking is represented only by women of the Chuvash Republic, and the heptathlon/decathlon is represented by athletes from Tatarstan.

The qualitative indicator reflects the average position of athletes in the ranking. The average position of Tatar and Chuvash athletes in the ranking deteriorated somewhat during this period, while there has been a positive dynamics in Yakut athletes over the past year (Fig. 2). But the downward dynamics of this indicator cannot be considered as a negative fact and in isolation from the quantitative changes, since the entry of new athletes into the ranking occurs from lower positions with their subsequent promotion to higher positions as individual achievements grow. Therefore, an increase in the number of athletes in the ranking (quantitative indicator), as a rule, leads to a decrease in the average rating (qualitative indicator).
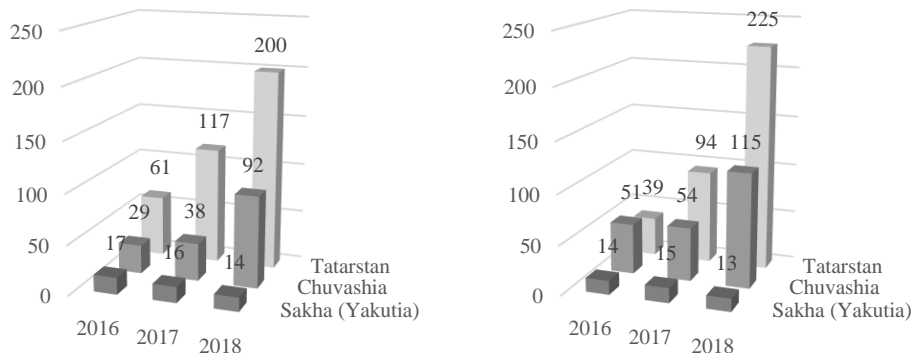

FIG. 1. THE TOTAL NUMBER OF ATHLETES IN THE ARAF RATING (MEN ON THE LEFT, WOMEN ON THE RIGHT), PERSONS
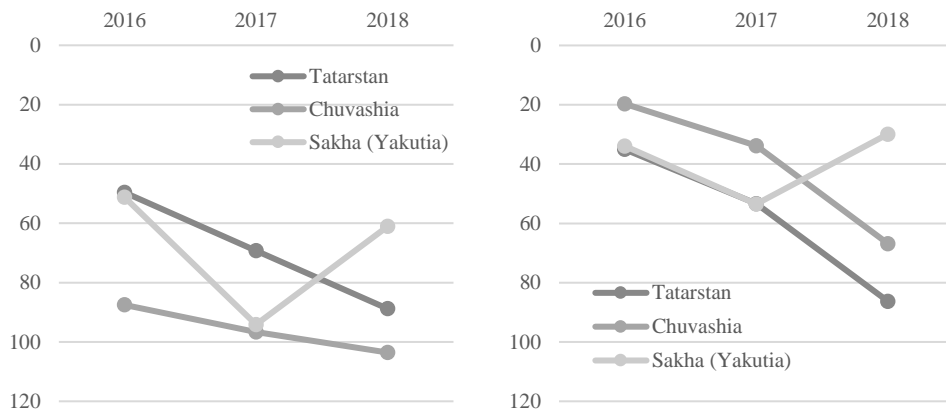
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FIG. 2. THE AVERAGE POSITION OF ATHLETES IN THE ARAF RANKING (MEN ON THE LEFT, WOMEN ON THE RIGHT)

The dynamics of average position changes in the running events has different trend, so, for the runners representing the Chuvash Republic it is clearly positive. However, we should pay attention to a noticeably higher middle position in women's running events among representatives of Chuvashia and Yakutia. The qualitative indicator in female jumping events is noticeably higher than in male ones in all three regions. The same is evident in throwing, with the exception of the Republic of Sakha (Yakutia), where the dynamics is multidirectional, indicating the presence of individual strong shot putters (such as, for example, Maxim Afonin with the second position in the All-Russian rating for three consecutive years). In women's throwing events, the picture is less optimistic. With all the recent successes of the Yakut school of shot put, in 2018 there was not a single representative of Yakutia in the ranking.

In addition to quantitative and qualitative indicators, an integral indicator was calculated, reflecting in aggregate the manifestation level of the first two indicators. Its determination was made by dividing the qualitative indicator by the quantitative one. Combining both quantitative and qualitative indicators, it characterizes the so-called "absolute" success (Fig. 3).

The integral indicator has positive dynamics among the athletes of Tatarstan, and mixed dynamics - among athletes of Chuvashia and Sakha (Yakutia) with the advantage of

female events over male ones. The big difference between regions in terms of integral indicator is noticeable in men's running events. But by 2018, the level of this indicator among runners from Chuvashia approached the level of runners from Tatarstan. In female running events, the competition between regions is noticeably sharper. Female jumping events generally look more successful than male ones. Competition with varying success between the representatives of Chuvashia and Tatarstan is noticeable. In men's throwing events, the presence of prominent representatives of the Yakut school of shot put provides this region with a high level of integral indicator and an advantage over two republics of the Volga region. But the same cannot be said of women's throwing events.

The same three indicators were used to evaluate the work of coaches. The quantitative indicator, in our opinion, reflects to a greater extent the success of the coach's work in children and youth athletics, and the qualitative indicator - in top level athletics. Table 3 presents the top ten coaches with the highest ratings in terms of quantitative (left) and qualitative (right) indicators. Among the coaches working in youth athletics there are three representatives of Chuvashia and Sakha (Yakutia) and four representatives of Tatarstan. Among the coaches working in top level athletics, there are two representatives of Sakha (Yakutia) and four representatives of Tatarstan and Chuvashia each.
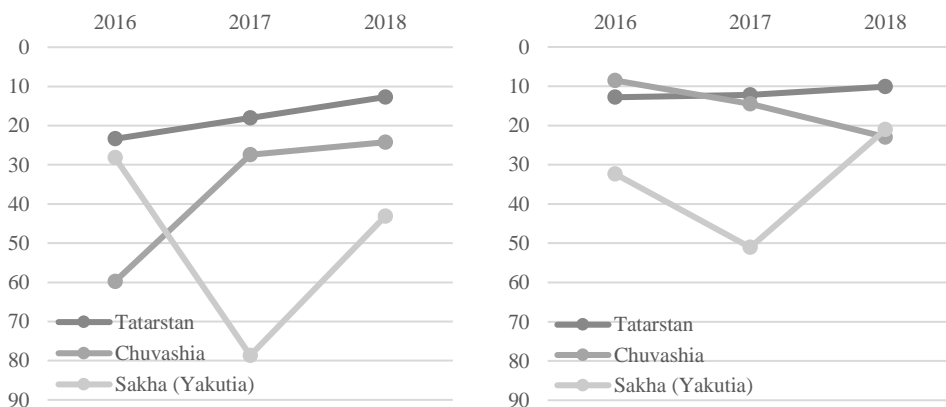

FIG. 3. THE AVERAGE POSITION IN THE ARAF RATING PER ATHLETE (MEN ON THE LEFT, WOMEN ON THE RIGHT)

TABLE 3. Top-10 coaches in athletics, representing the 3 regions of Russia

Children and youth athletics			Top level athletics		
Coach	Region	Integral indicator	Coach	Region	Integral indicator
Kolodko N.A.	RS(Y)	0,67	Litvinov Y.A.	CHR	0,63
Snesarev S.A.	RT	2,04	Kolodko N.A.	RS(Y)	0,67
Nechaev P.A.	RS(Y)	2,39	Abramova S.A.	CHR	1,07
Zakharchuk D.G.	RT	2,78	Terentjeva V.S.	CHR	1,48
Latypova N.P.	RT	2,85	Panfilov N.A.	CHR	2,50
Davalov V.N.	CHR	3,10	Pudov E.N.	RS(Y)	3,18
Pudov E.N.	RS(Y)	3,18	Kuzin V.V.	RT	3,24
Vostrikova I.A.	RT	3,38	Zhavoronok I.	RT	3,28
Kuznetsov M.P.	CHR	3,52	Mukhamedov G.A.	RT	3,32
Prokhorov A.A.	CHR	3,54	Kapustin D.V.	RT	4,13

TABLE 4. Top-10 organizations in athletics, representing the 3 regions of Russia

Children and youth athletics			Top level athletics		
Organization	Region	Integral indicator	Organization	Region	Integral indicator
SSOR Athletics	RT	0,67	CSP	RT	0,63
VRAPCST	RT	2,04	SSOR Znamenskikh	CHR	0,67
SSOR 3	CHR	2,39	SSOR "Luch"	RS(Y)	1,07
SSOR "Luch"	RS(Y)	2,78	SSOR 12 Nab. Chelny	RT	1,48
SCYSSOR TFA	RT	2,85	COVS	RS(Y)	2,50
SSOR 1 n.a. V. Egorova	CHR	3,10	"Yunost Moskvy"	RT	3,18
KCYSS Aviator	RT	3,18	Shinnik	RT	3,24
Neftekhimik	RT	3,38	CSP	RS(Y)	3,28
CSP n.a. A. Ignatjev	CHR	3,52	KO SSOR	CHR	3,32
CCOR n.a. V. Krasnov	CHR	3,54	SSOR "Luch"	CHR	4,13

These same three indicators were used to measure the performance of organizations. Table 4 presents the top ten organizations with the highest ratings in terms of quantitative (left) and qualitative (right) indicators. Among the organizations focused on children and youth athletics, there is one organization representing athletes of Sakha (Yakutia), four organizations representing athletes of Chuvashia, and five organizations representing athletes of Tatarstan. Among the organizations focused on top level athletics, there are three organizations each representing athletes from Sakha (Yakutia) and Chuvashia, and four - from Tatarstan. Here you can see a number of Moscow organizations that are actively working with the regions as part of the parallel classification.

IV. Conclusion

If a similar analysis is carried out in other regions, then we can have an opportunity for:

- assessment of the current situation on the state of athletics in the country ("strong", "weak" disciplines in regions);
- assessment of prospects in various disciplines in regions (quantitative and qualitative changes in dynamics over the years);
- strategic planning for the development of athletics on a national scale.

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